3-14-1985

# Test 1554: Massey-Ferguson 1040 Diesel 12-Speed

Tractor Museum
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# NEBRASKA TRACTOR TEST 1554—MASSEY FERGUSON 1040 DIESEL 12 SPEED

## POWER TAKE-OFF PERFORMANCE

| Power Hp (kW) | Crank shaft speed rpm | Fuel Consumption gal/hr (l/h) | lb/hp.hr (kg/kW.h) | Hp.hr/gal (kW.h/l) | Temperature °F (°C) Cooling medium | Air wet bulb | Air dry bulb | Barometer inch Hg (kPa) |
|---|---|---|---|---|---|---|---|---|
| **MAXIMUM POWER AND FUEL CONSUMPTION** | | | | | | | | |
| **Rated Engine Speed — Two hours (PTO Speed —578 rpm)** | | | | | | | | |
| 27.73 (20.68) | 2500 | 2.164 (8.193) | 0.544 (0.331) | 12.81 (2.524) | 186 (85.7) | 58 (14.3) | 75 (23.9) | 28.94 (97.73) |
| **Standard Power Take-off Speed (540 rpm) — One Hour** | | | | | | | | |
| 25.80 (19.24) | 2334 | 1.987 (7.523) | 0.537 (0.327) | 12.98 (2.557) | 184 (84.5) | 57 (13.8) | 75 (23.8) | 28.92 (97.66) |
| **VARYING POWER AND FUEL CONSUMPTION — Two Hours** | | | | | | | | |
| 24.47 (18.25) | 2596 | 2.005 (7.588) | 0.571 (0.347) | 12.21 (2.405) | 180 (82.2) | 57 (13.6) | 75 (23.6) | ..... ..... |
| 0.00 (0.00) | 2680 | 0.779 (2.947) | ..... ..... | ..... ..... | 167 (74.7) | 57 (13.6) | 75 (23.9) | ..... ..... |
| 12.47 (9.30) | 2643 | 1.338 (5.064) | 0.748 (0.455) | 9.32 (1.836) | 170 (76.4) | 57 (13.9) | 75 (23.9) | ..... ..... |
| 28.27 (21.08) | 2502 | 2.168 (8.207) | 0.535 (0.325) | 13.04 (2.569) | 185 (85.0) | 56 (13.3) | 76 (24.2) | ..... ..... |
| 6.26 (4.67) | 2653 | 1.058 (4.006) | 1.178 (0.717) | 5.92 (1.166) | 168 (75.3) | 56 (13.3) | 75 (23.9) | ..... ..... |
| 18.48 (13.78) | 2615 | 1.639 (6.204) | 0.618 (0.376) | 11.28 (2.221) | 171 (77.2) | 57 (13.6) | 75 (23.6) | ..... ..... |
| **Av 14.99** | **2615** | **1.498** | **0.697** | **10.01** | **173** | **56** | **75** | **28.91** |
| ***Av (11.18)*** | | ***(5.669)*** | ***(0.424)*** | ***(1.972)*** | ***(78.5)*** | ***(13.6)*** | ***(23.8)*** | ***(97.62)*** |

## DRAWBAR PERFORMANCE (Front Wheel Drive Disengaged)

| Power Hp (kW) | Drawbar pull lbs (kN) | Speed mph (km/h) | Crank-shaft speed rpm | Slip % | Fuel Consumption gal/hr (l/h) | lb/hp.hr (kg/kW.h) | Hp.hr/gal (kW.h/l) | Temp. °F (°C) Cool-ing med | Air wet bulb | Air dry bulb | Barom. inch Hg (kPa) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Maximum Available Power — Two Hours 10th (H2) Gear** | | | | | | | | | | | |
| 21.80 (16.25) | 1483 (6.60) | 5.51 (8.87) | 2500 | 6.63 | 2.165 (8.196) | 0.693 (0.421) | 10.07 (1.983) | 173 (78.3) | 45 (7.2) | 51 (10.6) | 28.72 (96.97) |
| **75% of Pull at Maximum Power — Ten Hours 10th (H2) Gear** | | | | | | | | | | | |
| 17.95 (13.39) | 1150 (5.12) | 5.85 (9.42) | 2614 | 5.20 | 1.884 (7.132) | 0.732 (0.445) | 9.53 (1.877) | 172 (77.6) | 43 (6.2) | 52 (11.2) | 28.77 (97.15) |
| **50% of Pull at Maximum Power — Two Hours 10th (H2) Gear** | | | | | | | | | | | |
| 12.26 (9.14) | 768 (3.41) | 5.99 (9.64) | 2640 | 3.95 | 1.563 (5.916) | 0.889 (0.541) | 7.84 (1.545) | 170 (76.7) | 38 (3.1) | 43 (6.1) | 29.09 (98.22) |
| **50% of Pull at Reduced Engine Speed — Two Hours 11th (H3) Gear** | | | | | | | | | | | |
| 12.25 (9.14) | 767 (3.41) | 5.99 (9.65) | 1855 | 3.79 | 1.217 (4.608) | 0.693 (0.422) | 10.06 (1.983) | 168 (75.6) | 44 (6.7) | 53 (11.4) | 29.05 (98.08) |
| **MAXIMUM POWER IN SELECTED GEARS** | | | | | | | | | | | |
| 21.17 (15.79) | 2795 (12.43) | 2.84 (4.57) | 2575 | 14.68 | 8th (M4) Gear | | | 174 (78.6) | 48 (8.9) | 60 (15.6) | 28.96 (97.79) |
| 22.32 (16.64) | 2233 (9.93) | 3.75 (6.03) | 2501 | 10.42 | 9th (H1) Gear | | | 173 (78.1) | 44 (6.7) | 49 (9.4) | 28.74 (97.05) |
| 22.57 (16.83) | 1533 (6.82) | 5.52 (8.89) | 2502 | 6.53 | 10th (H2) Gear | | | 173 (78.3) | 43 (6.1) | 48 (8.9) | 28.76 (97.12) |
| 21.43 (15.98) | 1002 (4.46) | 8.02 (12.91) | 2500 | 4.33 | 11th (H3) Gear | | | 173 (78.3) | 44 (6.7) | 50 (10.0) | 28.73 (97.02) |

## LUGGING ABILITY IN 10th (H2) GEAR

| Crankshaft Speed rpm | 2502 | 2241 | 2001 | 1755 | 1506 | 1247 | 998 |
|---|---|---|---|---|---|---|---|
| Pull—lbs (kN) | 1533 (6.82) | 1534 (6.82) | 1614 (7.18) | 1866 (8.30) | 2041 (9.08) | 2100 (9.34) | 1978 (8.80) |
| Increase in Pull % | 0 | 0 | 5 | 22 | 33 | 37 | 29 |
| Power—Hp (kW) | 22.57 (16.83) | 20.23 (15.08) | 18.94 (14.12) | 18.95 (14.13) | 17.59 (13.12) | 14.90 (11.11) | 11.32 (8.44) |
| Speed—Mph (kmh) | 5.52 (8.89) | 4.94 (7.96) | 4.40 (7.08) | 3.81 (6.13) | 3.23 (5.20) | 2.66 (4.28) | 2.15 (3.45) |
| Slip % | 6.53 | 6.63 | 6.84 | 8.14 | 9.22 | 9.70 | 9.03 |

**Department of Agricultural Engineering**

**Dates of Test:** March 14 - 26, 1985

**Manufacturer:** TOYOSHA COMPANY, LTD.,55 Joshoji-16, Kadoma City, Osaka, Japan

**FUEL, OIL AND TIME: Fuel** No. 2 Diesel **Cetane No.** 48.3 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F *(15/15°C)*** 0.8376 **Fuel weight** 6.974 lbs/gal *(0.836) kg/l)* **Oil SAE** 30 **API service classification** SE, SF, CC To motor 0.971 gal *(3.675 l)* **Drained from motor** 0.919 gal *(3.480 l)* **Transmission and final drive lubricant** Massey Ferguson Permatran III fluid **Total time engine was operated** 41.0 hours.

**ENGINE: Make** Toyosha Diesel **Type** three cylinder vertical **Serial No.** 3S200255 **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.622″ × 3.937″ *(92 mm × 100 mm)* **Compression ratio** 23 to 1 **Displacement** 121.7 cu in *(1994 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** one paper element **Oil filter** one full flow cartridge **Fuel filter** one paper cartridge and sediment bowl **Muffler** vertical **Cooling medium temperature control** one thermostat.

**CHASSIS: Type** front wheel assist **Serial No.** 40298 **Tread width** rear 45.3″ *(1150 mm)* to 63.6″ *(1615 mm)* front 47.2″ *(1200 mm)* **Wheel base** 68.9″ *(1750 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 30.6″ *(777 mm)* Vertical distance above roadway 28.1″ *(715 mm)* Horizontal distance from center of rear wheel tread 0.1″ *(2 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph *(km/h)*** first 0.4 *(0.6)* second 0.5 *(0.8)* third 0.7 *(1.2)* fourth 1.0 *(1.6)* fifth 1.2 *(1.9)* sixth 1.7 *(2.7)* seventh 2.4 *(3.8)* eighth 3.3 *(5.3)* ninth 4.2 *(6.8)* tenth 6.0 *(9.6)* eleventh 8.5 *(13.6)* twelfth 11.6 *(18.6)* reverse 0.7 *(1.1)*, 2.3 *(3.7)*, 8.2 *(13.2)* **Clutch** single dry disc operated by foot pedal **Brakes** multiple wet disc operated by two foot pedals which can be locked together **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 112″ *(2.84 m)* left 112″ *(2.84 m)*(on concrete surface without brake) right 125″ *(3.18 m)* left 125″ *(3.18 m)* **Turning space diameter** (on concrete surface with brake applied) right 232″ *(5.89 m)* left 232″ *(5.89 m)*(on concrete surface without brake) right 258″ *(6.55 m)* left 258″ *(6.55 m)* **Power take-off** 540 rpm at 2334 engine rpm **Unladen tractor mass** 3620 lb *(1642 kg)*.

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

| TRACTOR SOUND LEVEL WITHOUT CAB | Front Wheel Drive Engaged dB(A) | Front Wheel Drive Disengaged dB(A) |
|---|---|---|
| Maximum Available Power—Two Hours | 88.5 | 88.0 |
| 75% of Pull at Maximum Power—Ten Hours | | 90.0 |
| 50% of Pull at Maximum Power—Two Hours | | 89.5 |
| 50% of Pull at Reduced Engine Speed—Two Hours | | 88.0 |
| Bystander in 12th (H4) gear | | 78.5 |

## DRAWBAR PERFORMANCE
## (Front Wheel Drive Engaged)

| Power Hp *(kW)* | Drawbar pull lbs *(kN)* | Speed mph *(km/h)* | Crank-shaft speed rpm | Slip % | Fuel Consumption gal/hr *(l/h)* | lb/hp.hr *(kg/kW.h)* | Hp.hr/gal *(kW.h/l)* | Temp. °F *(°C)* Cool-ing med | Air wet bulb | Air dry bulb | Barom. inch Hg *(kPa)* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Maximum Available Power — Two Hours 10th (H2) Gear** | | | | | | | | | | | |
| 20.91 *(15.59)* | 1364 *(6.07)* | 5.75 *(9.25)* | 2500 | 4.94 | 2.165 *(8.196)* | 0.722 *(0.439)* | 9.66 *(1.902)* | 173 *(78.3)* | 45 *(7.2)* | 52 *(10.8)* | 28.70 *(96.90)* |
| **MAXIMUM POWER IN SELECTED GEARS** | | | | | | | | | | | |
| 19.93 *(14.86)* | 3501 *(15.57)* | 2.13 *(3.44)* | 2585 | 14.78 | 7th (M3) Gear | | | 173 *(78.3)* | 47 *(8.3)* | 58 *(14.4)* | 29.01 *(97.96)* |
| 22.11 *(16.49)* | 2090 *(9.29)* | 3.97 *(6.39)* | 2501 | 7.48 | 9th (H1) Gear | | | 172 *(77.8)* | 44 *(6.7)* | 49 *(9.4)* | 28.74 *(97.05)* |
| 21.65 *(16.15)* | 1413 *(6.29)* | 5.75 *(9.25)* | 2501 | 4.94 | 10th (H2) Gear | | | 173 *(78.3)* | 43 *(6.1)* | 48 *(8.9)* | 28.77 *(97.15)* |

| TIRES, BALLAST AND WEIGHT | | With Ballast | Without Ballast |
|---|---|---|---|
| **Rear Tires** | —No., size, ply & psi *(kPa)* | Two 13.6-24; 4; 14 *(195)* | Two 13.6-24; 4; 14 *(195)* |
| Ballast | —Liquid (each) | None | None |
| | —Cast Iron (each) | 435 lb *(198 kg)* | None |
| **Front Tires** | —No., size, ply & psi *(kPa)* | Two 8-16; 4; 22 *(150)* | Two 8-16; 4; 22 *(150)* |
| Ballast | —Liquid (each) | None | None |
| | —Cast Iron (each) | 22 lb *(10 kg)* | None |
| **Height of Drawbar** | | 15 in *(380 mm)* | 15 in *(380 mm)* |
| **Static Weight with Operator**— | Rear | 3060 lb *(1388 kg)* | 2190 lb *(993 kg)* |
| | —Front | 1655 lb *(751 kg)* | 1610 lb *(730 kg)* |
| | —Total | 4715 lb *(2139 kg)* | 3800 lb *(1723 kg)* |

## THREE POINT HITCH PERFORMANCE

| | | |
|---|---|---|
| Observed Maximum Pressure psi *(kPa)* | 1875 *(12930)* | |
| Location | lift cylinder | |
| Hydraulic oil temperature °F *(°C)* | 145 *(63)* | |
| Location | pump inlet | |

| | Maximum Lift Capacity | | Lift Capacity for Transport |
|---|---|---|---|
| QUICK ATTACH | no | | |
| CATEGORY | I | | *not measured |
| LOAD lbs *(kg)* | 1734 | *(787)* | |
| TIME sec | 1.88 | | |
| HITCH POINT MOVEMENT in *(mm)* | | | |
| Lowest position | 11.0 | *(279)* | |
| Top of timed range | 32.0 | *(813)* | |
| Highest position | ** 32.0 | *(813)* | |
| LOAD CG MOVEMENT in *(mm)* | | | |
| Lowest position | 11.9 | *(302)* | |
| Top of timed range | 30.3 | *(770)* | |
| Highest position | 30.9 | *(784)* | |

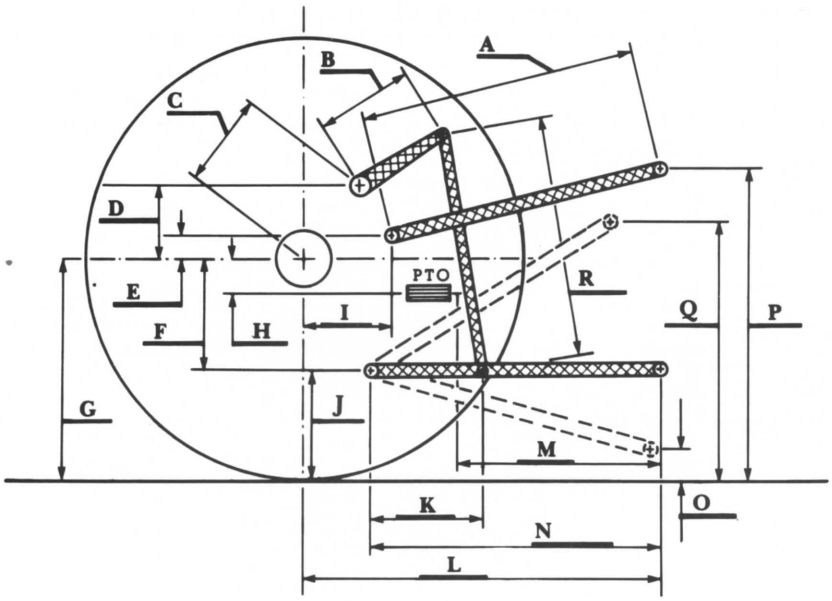
*Implement load capacity for transport purposes not specified by manufacturer.
**The observed power range, 21 in *(534 mm)* is less than the minimum power range for Cat I, 22 in *(559 mm)* specified by ASAE Standard S217.10.

**REMARKS:** All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 146°F *(63.3°C)*. Four gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No.**1554**, June 13, 1985.

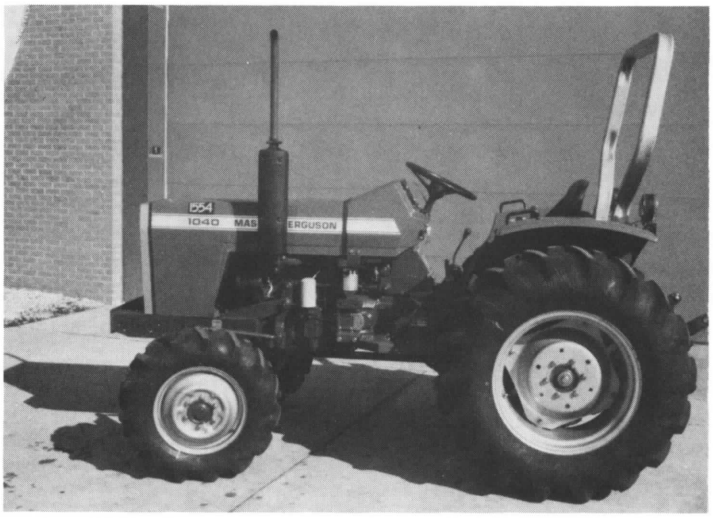
LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
L. L. BASHFORD
T. L. THOMPSON
Board of Tractor Test Engineers




**Hitch Dimensions as Tested — No Load**

| | inch | *mm* |
|---|---|---|
| A | 19.5 | *495* |
| B | 10.6 | *270* |
| C | 15.5 | *393* |
| D | 15.2 | *386* |
| E | 16.1 | *409* |
| F | 5.3 | *135* |
| G | 21.7 | *551* |
| H | 1.8 | *47* |
| I | 12.3 | *312* |
| J | 16.4 | *417* |
| K | 15.4 | *390* |
| L | 32.2 | *819* |
| M | 21.8 | *554* |
| N | 25.6 | *650* |
| O | 8.0 | *203* |
| P | 34.4 | *874* |
| Q | 30.8 | *782* |
| R | 23.0 | *584* |




**Massey Ferguson 1040 Diesel**

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